WHAT IS CLAIMED IS:

1. An acoustic resonator comprising:

a substrate; and

a layer stack integrated to said substrate such that said layer stack includes a suspended region, said suspended region including:

a piezoelectric body and electrodes positioned to apply an electrical field to said piezoelectric body, said piezoelectric body and electrodes having a resonance and a negative temperature coefficient of frequency; and

a compensator acoustically coupled to said piezoelectric body and electrodes, said compensator body being formed of a material having properties by which said compensator at least partially offsets temperature-induced effects on said resonance, where said temperature-induced effects are a function of said negative temperature coefficient of frequency.

2. The acoustic resonator of claim 1 wherein said compensator is a ferromagnetic layer that is spaced apart from said piezoelectric body by one of said electrodes, said ferromagnetic layer being associated with a positive temperature coefficient of frequency.

3. The acoustic resonator of claim 1 wherein said layer stack includes a peripheral region that contacts said substrate to support said suspended region, said compensator being a layer of a nickel-iron alloy.

4. The acoustic resonator of claim 1 wherein said layer stack further includes a metallic flashing layer on a side of said compensator opposite to said electrodes and said piezoelectric body.

5. The acoustic resonator of claim 1 wherein said layer stack is a thin film bulk resonator (FBAR) stack.

6. The acoustic resonator of claim 1 wherein said compensator is formed of a material having a positive temperature coefficient of frequency and has a thickness such that a magnitude of temperature-induced effects on said resonance by presence of said compensator is similar to a magnitude of said temperature-induced effects on said resonance as a function of said negative temperature coefficient of frequency.

7. The acoustic resonator of claim 1 wherein said substrate is a silicon substrate and wherein said electrodes and compensator are metallic layers.

8. An acoustic resonator comprising:

a substrate;

an electrode-piezoelectric stack having a target resonant frequency and having a negative temperature coefficient of frequency; and

a metallic compensator layer having a positive temperature coefficient of frequency, said metallic compensator layer being acoustically coupled to said electrode-piezoelectric stack.

9. The acoustic resonator of claim 8 wherein said electrode-piezoelectric stack and said metallic compensator layer combine to define an FBAR.

10. The acoustic resonator of claim 9 wherein a major portion of said FBAR is suspended from contact with said substrate.

11. The acoustic resonator of claim 8 wherein said metallic compensator layer is formed of a nickel-iron alloy.

12. The acoustic resonator of claim 11 wherein said nickel-iron alloy is approximately 35 percent nickel and approximately 65 percent iron.

~~13. The acoustic resonator of claim 8 wherein said metallic compensator layer has a thickness selected to neutralize influences of temperature variations on resonance of said electrode-piezoelectric stack such that said target resonant frequency is substantially maintained.~~

14. A method of fabricating an acoustic resonator comprising the steps of:

providing a substrate; and

forming a membrane on said substrate such that at least a portion of said membrane is suspended from contact with a substrate, including:

(a) forming an electrode-piezoelectric stack having a negative temperature coefficient of frequency, and

(b) forming a compensator layer adjacent to said electrode-piezoelectric stack, including selecting a material having a positive temperature coefficient of frequency.

15. The method of claim 14 wherein said step (b) that includes selecting said material includes selecting a nickel-iron alloy.

16. The method of claim 14 wherein said step (b) includes depositing said material as approximately 35 percent nickel and approximately 65 percent iron.

17. The method of claim 14 wherein said step (b) includes selecting a layer thickness to substantially match a magnitude of temperature-induced effects on resonance by operation of said electrode-piezoelectric stack with a magnitude of temperature-induced effects on said resonance as a consequence of said compensator layer.

18. The method of claim 14 wherein said step of forming said membrane further includes (c) forming a metallic flashing layer on a side of said compensator layer opposite to said electrode-piezoelectric stack.

19. The method of claim 18 further comprising using fabrication alignment techniques in said steps (b) and (c) to prevent spurious mode generation resulting from partial coverage of said suspended membrane by said compensator layer or said flashing layer.